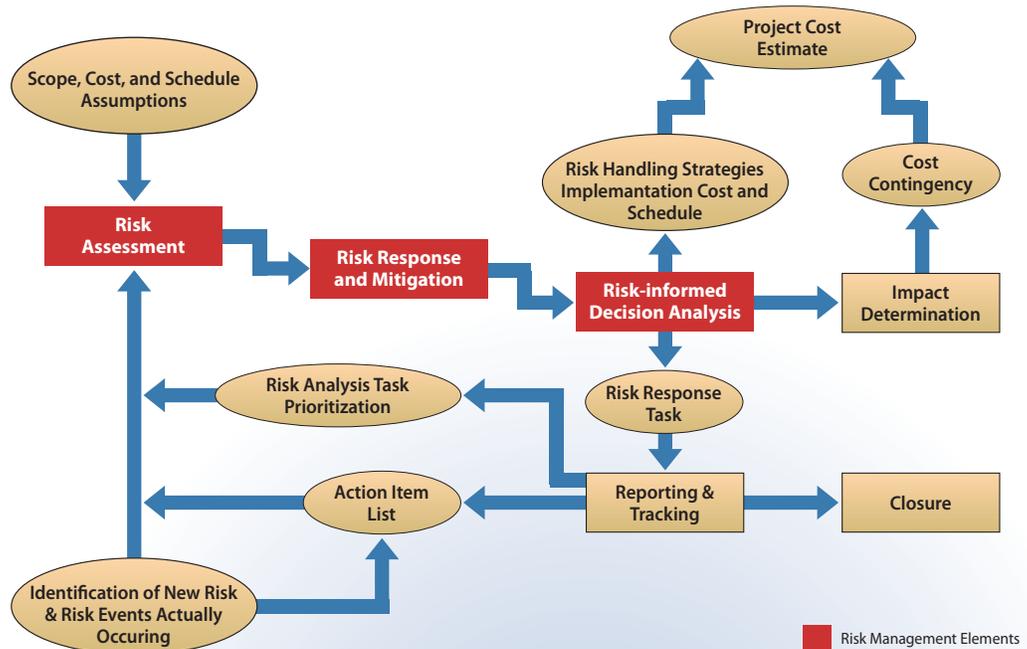


Risk management provides the structured, formal, and disciplined approach to identify potential project and technical risks before they occur and control those risks to an acceptable level so the probability of failure is reduced or eliminated.



Risk Management

Risk is a measure of the potential to fall short of project objectives within defined scope, cost, schedule, and technical constraints. Risk management provides the structured, formal, and disciplined approach to identify potential project and technical risks before they occur and control those risks to an acceptable level so the probability of failure is reduced or eliminated.

Effective risk management is fundamental to any successful project. Systems Analyses and Engineering (SA&E) develops and employs advanced tools and techniques to maximize the effectiveness of project risk management efforts.

Risk Management Approach

DOE Risk Management Guide G 413.3-7, establishes a clear expectation that projects identify and analyze risks as early as possible in a project life cycle and iteratively throughout the succeeding project stages to ensure risks have been satisfactorily managed. As shown in the figure above, the SA&E follows a three-step approach to identifying and managing project and technical risk.

- **Risk Assessment** – Complex projects have a high degree of technical risk or uncertainty. Based on tools and techniques developed by the Department of Defense and NASA, along

with some specific advances made at INL, technical risks are identified and analyzed against the technical maturity of the system to estimate project uncertainty in terms of cost, scope, or schedule. This ability is vital in accurately bounding project costs and schedule baselines.

- **Risk-Informed Decision Analysis** – In addition to providing valuable input for predicting cost and schedule impacts, uncertainty and risk is factored into decision criteria when evaluating two or more technical alternatives. Historically, decisions are often based on a best guess regarding the performance of a given al-

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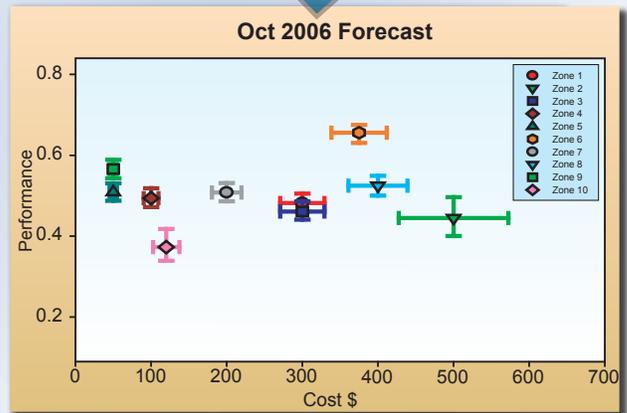
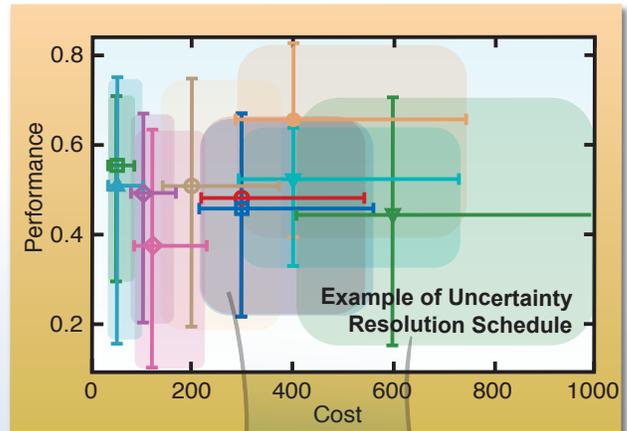
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ternative against a set of criteria that reflects customer needs. Such decisions may not reflect the alternative, especially if the decision is made early in a project when technologies are still maturing. SA&E uses both quantitative and qualitative methods to analyze and visualize uncertainty as it relates not only to cost and schedule, but also to other performance criteria so that the full range of possible performance can be factored into the final decision. In some cases, this may lead to the realization that the time is not right for a decision or that more information is needed before a risk-informed decision can be made.

Risk Response and Mitigation

The final step in the risk management approach is to develop a plan to reduce or eliminate the risk and associated uncertainty. Risk response and mitigation strategies are selected after the potential impact has been determined so that the strategy is appropriate for the given risk. By linking project efforts to known resolutions and advances in technology maturity, the rate at which uncertainty is reduced can be predicted and, in some cases, enhanced. Such comparisons are extremely useful in helping projects monitor and drive uncertainty reduction.

These tools and techniques are combined to form a technical risk reduction strategy,



Risk information is tracked in a formal Risk Management System that provides traceability, forecasting, and reporting capabilities.

sometimes referred to as a focused roadmap. The tools can be applied to technical or programmatic risk, including economic, stakeholder, and political risk.

Risk Tracking and Reporting

Identified risks and their associated mitigation actions are tracked and reported throughout the project lifecycle to increase the probability of success and decrease the likelihood of unanticipated cost

overruns, schedule delays, technical failures, and compromises in quality and safety.

For complex projects, risk information is tracked in a formal Risk Management System that provides traceability, forecasting, and reporting capabilities. Risk information is included in all program reviews.

For more information

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